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EXAMINER	
HWU, JUNE	

ART UNIT	PAPER NUMBER
1661	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/692,762	ARMSTRONG ET AL.	
	Examiner	Art Unit	
	June Hwu	1661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,7,8,10-14,17-22,26,27,31-33,35-41,43-45,49-52 and 54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1,7,8,10-14,17-22,26,27,31-33,35-41,43-45,49-52 and 54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The request for continued examination under 37 CFR 1.114 filed on October 11, 2007 is not accepted because the last Office Action was a non-final. 37 CFR 1.114 provides a procedure under which an applicant may obtain continued examination of an application in which prosecution is closed (e.g., the application is under final rejection or a notice of allowance) by filing a submission and paying a specified fee.

The text of those sections of Title 35, U.S. Code not included in this action can be found in the prior Office action.

Status of the Claims

Claims 2-6, 9, 15-16, 23-25, 28-30, 34, 42, 46-48, 53, and 55-58 are cancelled; claims 1, 7-8, 10-14, 17-22, 26-27, 31-33, 35-41, 43-45, 49-52 and 54 will be examined on the merits.

The objections of claims 1, 11, 12, 14, 18, 20, 28, 31, 36, 37, 38, 39, 44, and 50 at line 2; claim 8 at line 3; and claims 39 and 50 at line 4 are withdrawn due to Applicants' amendment of the claims.

The rejection of claim 1 under 35 U.S.C. 102(b) as being anticipated by Smith et al (In Vitro, vol. 13, no. 5, 1977, pp. 329-334) is withdrawn due to Applicants' amendment of the claim to non-embryogenic cotton callus tissue derived from hypocotyl.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 and 14, 17-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Dependent claims are included in all rejections.

Neither the instant specification nor the originally filed claims appear to provide support for the phrase "regenerable embryogenic callus tissue" in claims 1 and 14. The specification states, "formation of embryogenic cotton callus" on p. 4, line 20 and "any regenerable cotton tissue" on p. 15, line 18. In addition, neither the instant specification nor the originally filed claims appear to provide support for the phrase "regenerable embryogenic callus tissue" in claims 1 and 14.

Applicants urge that support for claims 1 and 14 for the phrase "regenerable embryogenic cotton callus" can be found in claim 6 as originally filed. This is not found persuasive because claim 6 as originally filed states "regenerable non-embryogenic cotton callus tissue" (emphasis underlined). Applicants further state support for "regenerable embryogeinc cotton callus" can be found on page 4, lines 22-26. The instant specification on page 4, lines 22-26 describes the induction of "embryogenic cotton callus".

Thus, such a phrase constitutes NEW MATTER. In response to this rejection, Applicants are required to point to support for the phrase or cancel the new matter.

Claim Rejections - 35 USC § 102

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Finer (Canadian Patent 1,309,367). The rejection is modified from the rejection set forth in the Office action mailed October 11, 2007, due to Applicants' amendment of the claim.

The claim is drawn to a method of inducing the formation of regenerable embryogenic callus tissue from non-embryogenic cotton callus tissue derived from hypocotyl comprising culturing said non-embryogenic cotton tissue in media under dark lighting condition (0 μEinsteins $m^{-2}sec^{-1}$) to obtain regenerable embryogenic callus tissue therefrom.

Finer discloses a method of producing pro-embryonic cotton cell masses that are capable of regenerating into mature embryos, plantlets and whole plants (abstract and p. 3, lines 26-28). The explant used for the induction of cotton callus was hypocotyl (p. 4, last par. and p. 5, 2nd par.). The callus formed may be unorganized or may contain pro-embryonic cell masses, embryogenic callus and/or embryos (p. 7, 5th par.). The callus may be induced in the dark (p. 8, 1st par.). The development of the callus is placed in a liquid medium to promote development of pro-embryonic or proliferating embryonic cell masses (p. 8, 2nd par.) and may be cultured under dark light condition (p. 9, 2nd par.). The pro-embryonic cell masses are transferred to a liquid medium with auxin and may be cultured under dark condition (p. 10, 4th par.). The matured embryos are placed in a solid medium for germination and once germinated the plantlets are transferred to soil for further growth into plants (p. 14, 1st par.).

Claim Rejections - 35 USC §§ 102 -103

Claim 1 is rejected under 35 U.S.C. 102 (b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Smith et al (In Vitro, vol. 13, no. 5, 1977, pp. 329-334). The rejection is modified from the rejection set forth in the Office action mailed October 11, 2007, due to Applicants' amendment of the claim.

The claims are drawn to a method of inducing formation of regenerable embryogenic cotton callus tissue from non-embryogenic cotton tissue comprising culturing in media under

dark lighting condition (0 μEinsteins $m^{-2}sec^{-1}$) to obtain regenerable embryogenic callus tissue therefrom.

Smith et al discloses a method of callus initiation of *Gossypium* (cotton) by culturing cotton callus tissues in a dark incubator or limited light condition (1000 to 2000 lux) (p. 330, right col. 2nd full paragraph). On the MS (Murashige and Skoog) medium all explant sources formed a friable callus with glucose as the carbohydrate source (p. 330, right col. last par.). The instant claim and Smith et al disclose the same method of inducing formation of cotton callus tissue and, therefore the results of obtaining regenerable embryogenic cotton callus tissue would have been obvious. The citation of "hypocotyl" in the preamble does not have any patentable weight. Thus, the claimed invention was *prima facie* obvious as a whole to one of ordinary skill in the art at the time it was made, if not anticipated by, the prior art.

Claim Rejections - 35 USC § 103

Claims 1, 8, 10-12, 14, 17, and 18 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Firoozabady et al (In Vitro Cell. Dev. Biol. 299:166-178, 1993) in view of Davis et al (*In Vitro* vol. 9, no. 6, 1974, pp. 395-398) and further in view of Chi et al (Plant Cell Reports (1990) 9: 195-198).

Applicants' arguments filed on October 11, 2007 have been fully considered but they are not persuasive.

Applicants urge that each of the limitations may be utilized separately and traverse the rejections separately (response p. 10).

This is not found persuasive because one cannot show nonobviousness by attacking the reference individually where the rejections are based on combination of references. See MPEP 2145.

Applicants urge that Firoozabady et al do not describe culturing embryogenic callus under dark light condition (response p. 11).

This is not found persuasive because Firoozabady et al state that "For embryogenic callus formation and proliferation, high temperature and low light (9 $\mu E \cdot m^{-2} \cdot s^{1}$) were preferred by Coker 201 and 315 and GSA 78" (p. 170). The recitation "preferred" means that certain varieties "preferred" the "low light". Firoozabady et al is silent on dark light condition for other varieties (see Table 2 for cultivars listed).

Applicants urge that Firoozabady et al are silent with regard to the growth of the embryos to produce plants and Firoozabady et al do not describe any light conditions for embryo growth on page 171, right col., 1st full paragraph (response p. 11).

This is not found persuasive because Firoozabady et al state that "After somatic embryos were formed, high intensity (90 $\mu E \cdot m^{-2} \cdot s^{1}$) proved to be very helpful for germination and plantlet development (data not shown)" (p. 170, left col. lines 2-4). Therefore, Firoozabady's plants eventually underwent embryogenesis.

Applicants urge that the combination of Firoozabady et al, in view of Davis et al and further in view of Chi et al do not cure the defect in the rejection of claim 1, regarding the growth of cotton callus tissue in dark to obtain embryogenic callus (response p. 12).

This is not found persuasive because Firoozabady et al disclose that callus tissue had been initiated and maintained in complete darkness and then later state that low light was preferred for embryogenic callus formation meaning that under dark condition embryogenic callus probably formed but not as well under low light conditions.

Applicants urge that Davis et al do not relate to growth of regenerable or embryogenic callus, or to culturing callus in an embryo-inducing medium (response p. 12).

This is not found persuasive because Davis et al was combined with Firoozabady et al and Chi et al to show that cotton callus tissue formed with the addition of ascorbic acid in the medium (p. 396, right col.). Chi et al was combined with Firoozabady et al and Davis et al to show the advantage of adding AVG (aminoethoxyvinylglycine) in the shoot regeneration medium. If the callus tissue were allowed to further develop under dark light condition as taught by Firoozabady et al and the addition of AVG in the culture medium as taught by Chi et al, then regenerable embryogenic callus tissue could have been obtained. Davis et al and Chi et al do not need to teach every element of the claim. The test for obviousness is not whether the features of other references may be bodily incorporated into the structure of the primary reference and not that the claimed invention must be expressly suggested in any one or all of the references; but rather the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.

Applicants urge that claims 8 and 10-12 do not relate to growth of callus tissue *per se* but rather to growth of embryogenic callus tissue in an embryo-inducing medium (response p. 13).

This is not found persuasive because if the cotton callus tissue is allowed to continue to grow in medium containing antioxidant as taught by Chi et al and further in view of Davis et al the callus tissue will eventually promote embryogenesis.

Applicants urge that Davis et al had not successfully grown embryogenic cotton cells or cotton cells that were regenerable (response p. 13).

This argument is not found persuasive because Davis et al was combined with Firoozabady et al and Chi et al to show that non-embryogenic cotton tissue grown under dark condition supplemented with AVG would eventually become regenerable embryogenic callus tissue as claimed.

Applicants urge that *Brassica* species are not closely related to cotton plant species and that regeneration in *Brassica* through organogenesis is not the same as embryogenic regeneration of cotton as claimed in this instant application (response p. 14).

This argument is not found persuasive because Chi et al was combined with Firoozabady et al and Davis et al to show that AVG is beneficial *in vitro* and that it would have been obvious to add AVG in the induction medium of Firoozabady et al to promote embryogenic callus tissue. Chi et al noted several reports the advantage of inhibition of ethylene for plant regeneration and growth and differentiation of plant cells (p. 195, left col.). Chi et al showed what was known in the art of tissue culturing, and thus do not need to be directed to cotton.

Applicants urge that Chi et al states, "The effect of AVG and $AgNO_3$ on shoot regeneration varies with genotype and explant source" and that there would be no expectation of success because of the variability (response p. 15).

This argument is not found persuasive because of the many advantages of using AVG in various tissue cultures as stated by Chi et al on p. 195, it would have been obvious to try AVG on callus tissue to promote regenerable embryogenic callus tissue.

Claims 7, 13, 19-22, 26-27, 45 and 49 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Firoozabady et al (1993) in view of Davis et al, and further in view of Chi et al as applied to claims 1, 8, 10-12, 14, 17, and 18 above, and further in view of Gould (Plant Cell Reports (1991) 10:12-16).

Applicants' arguments filed on October 11, 2007 have been fully considered but they are not persuasive.

Applicants urge that Gould describes transformation of cotton apical meristem and not embryogenesis as claimed (response pp. 15-16).

This argument is not found persuasive because Gould was combined with Firoozabady et al, Davis et al and Chi et al to show regeneration of cotton tissue for transformation wherein the culture is wrapped with a sealing material.

Applicants urge that one of skill in the art would not apply the teaching of Firoozabady et al, Davis et al and Chi et al relating to callus cell culture of cotton somatic embryogenesis with the teaching of Gould relating to transformation of cotton apical meristem and regeneration of plants through organogenesis (response pp. 16-17).

This argument is not found persuasive because as stated above Gould was combined with Firoozabady et al, Davis et al and Chi et al to show regeneration of cotton tissue for transformation wherein the culture is wrapped with a sealing material, PARAFILM. Transformation in general is a method of introducing new varieties of plants with improved characteristics. Thus, it would have been obvious to use a method of transformation to create new cotton plants.

Claims 31-33 and 35 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Firoozabady et al (1993) in view of Davis et al, and further in view of Chi et al as applied to claims 1, 5-6, 8, 10-12, 14, 17, and 18 above, and further in view of Firoozabady et al (Plant Molecular Biology 10: 105-116, 1987).

Applicants' arguments filed on October 11, 2007 have been fully considered but they are not persuasive.

Applicants urge that the embryogenic cotton tissue is not being placed on the filter paper, but rather, cotyledon pieces are being placed on the filter paper (response p. 17).

This argument is not found persuasive because Firoozabady et al (1987) was to show that filter paper can be used in tissue culture and that it was combined with Firoozabady et al (1993), Davis et al, and Chi et al.

Applicants urge that the induction of embryogenesis step in Firoozabady et al (1987) on page 108 would be most comparable with the instant claims use of filter paper but Firoozabady et al (1987) do not teach the use filter paper during the embryo maturation culture (response pp. 17-18).

This argument is not found persuasive because as stated above it would have been obvious to use the filter paper on the embryo maturation medium to ease in removing the embryos.

Claims 36-38 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Gould et al in view of Rangan (U.S. Patent No. 5,244,802).

Applicants' arguments filed on October 11, 2007 have been fully considered but they are not persuasive.

Applicants urge that Gould relates to culturing cotton shoot apical meristem and avoid the callus formation (response p. 18).

This argument is not found persuasive because the claims are drawn to a method of culturing cotton tissue in medium containing amino acid hydrolysate supplement.

Applicants urge that it is unclear how the addition of casein hydrolysate as taught by Rangan to apical meristem culture as taught by Gould would be applicable (response pp. 18-19).

This argument is not found persuasive because Gould taught a method of cotton transformation of cotton tissue and was combined with Rangan who taught the addition of

casein hydrolysate (amino acid hydrolysate) to promote somatic embryos. Thus, it would have been obvious to add amino acid hydrolysate to the medium to encourage the development of embryogenic callus as taught by Rangan to the method of plant transformation of cotton as taught by Gould.

Applicants urge that Gould does not describe or contemplate the use of somatic embryos in any way (response p. 19).

This argument is not found persuasive because as stated above the claims are drawn to a method of culturing transgenic cotton tissue in medium containing amino acid hydrolysate supplement.

Claims 39-41, 43 and 44 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Firoozabady et al (1993) in view of Davis et al, in view of Chi et al, in view of Firoozabady et al (1987) as applied to claims 31-33 and 35 above, and further in view of Rangan.

Applicants' arguments filed on October 11, 2007 have been fully considered but they are not persuasive.

Applicants noted the typographic error that the Examiner typed on page 11 of Office Action filed on June 11, 2007 that the claims were drawn to "non regenerable cotton callus". Examiner apologized for the error and had meant to type "regenerable non-embryogenic cotton callus tissue."

Applicants urge that Firoozabady et al (1993) in view of Davis et al, in view of Chi et al, in view of Firoozabady et al (1987) taken together do not teach or motivate a skilled person in the art to practice the invention such as the use of a support matrix (filter paper) in culturing embryogenic tissue (response p. 19).

This argument is not found persuasive because as stated above it would have been obvious to try using filter paper in the embryo maturation step to ease in the removing the embryo.

Applicants urge that Rangan does not cure the defect regarding the use of a support matrix (response p. 19).

This argument is not found persuasive because Rangan was combined with Firoozabady et al (1993), Davis et al, Chi et al, and Firoozabady et al (1987) to show that amino acid hydrolysate (casein hydrolysate) was beneficial in the development of embryos (col. 13, lines 65-68).

Applicants urge that Rangan does not relate to the limitation regarding to prior culture of non-embryogenic cotton callus tissue under dark conditions (response p. 20).

This argument is not found persuasive because as stated above Rangan was combined with Firoozabady et al (1993), Davis et al, Chi et al, and Firoozabady et al (1987) to show that amino acid hydrolysate (casein hydrolysate) was beneficial in the development of embryos. Firoozabady et al (1993) taught the use of non-embryogenic cotton tissue grown under dark light conditions and eventually the tissue would have developed into regenerable embryogenic callus.

Applicants urge that the teachings of Firoozabady (1993) do not teach culturing embryogenic callus under dark light conditions (response p. 20).

The implication of Firoozabady (1993) statement is that some varieties liked low light and others liked other light conditions, including darkness.

Claims 50-52 and 54 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Firoozabady et al (1993) in view of Davis et al, in view of Chi et al, in view of Firoozabady

et al (1987), in view of Rangan as applied to claims 39-41, 43 and 44 above, and further in view of Gould.

Applicants' arguments filed on October 11, 2007 have been fully considered but they are not persuasive.

Applicants urge that Gould related to culturing shoot apical meristems under continuous high light conditions and does not teach culturing embryogenic cotton cell culture under dark lighting, limited light conditions, or green light (response p. 21).

This argument is not found persuasive because Gould was combined with Firoozabady et al (1993), Davis et al, Chi et al, Firoozabady et al (1987), and Rangan to show that it would have been obvious to seal the culture medium with a sealing material. Firoozabdy (1993) taught the dark lighting conditions. The limited light conditions and green light are not cited in the claims, and thus irrelevant.

Applicants urge that there is no motivation in Gould to wrap the culture with PARAFILM to alleviate contamination (response pp. 21-22).

This argument is not found persuasive because it is well known in the art that wrapping sealing material around the culture plates would reduce contamination by accidental dropping of culture plates.

Finally Applicants urge that it would not be clear to a person skilled in the art to pick and choose the cited prior arts to arrive at the claimed invention (response p. 22).

This argument is not found persuasive because the rejections under 35 USC 103(a) are based on combinations of references.

For the reasons outlined above and in the previous Office action, the rejection is deemed proper and is maintained.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to June Hwu whose telephone number is (571) 272-0977. The Examiner can normally be reached Monday through Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Anne Marie Grunberg, can be reached on (571) 272-0975. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ANNE KUBELIK, PH.D.
PRIMARY EXAMINER